

Data report: Monitoring COVID-19 in Wastewater in the Chicago region

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Background

The [Illinois Department of Public Health \(IDPH\)](#), [Cook County Department of Public Health \(CCDPH\)](#) and [Chicago Department of Public Health \(CDPH\)](#) collect data from a variety of sources to understand the COVID-19 pandemic. Wastewater can be used to track spread since the virus is shed in the feces of infected individuals. By measuring the amount of SARS-CoV-2 in wastewater, public health officials gather information about the amount of COVID-19 transmission at a community level.

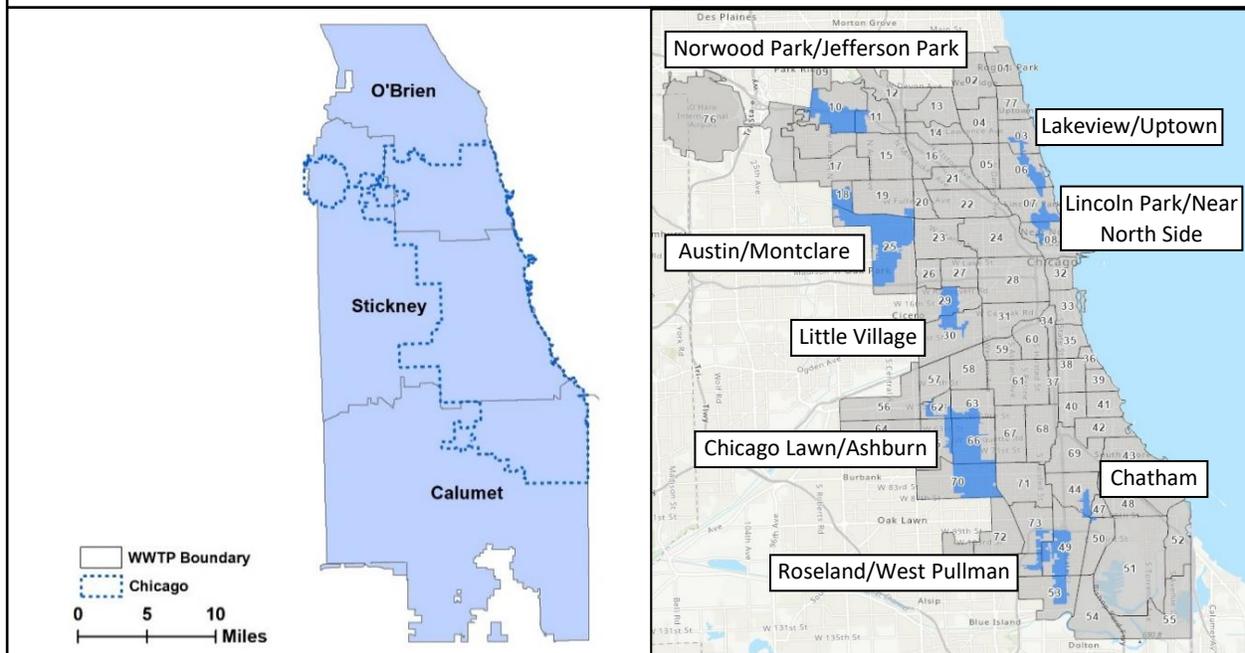
The wastewater monitoring system in the Chicago region

[IDPH](#), [CCDPH](#), and [CDPH](#) partner with the [University of Illinois Discovery Partners Institute \(DPI\)](#) and the [Metropolitan Water Reclamation District of Greater Chicago \(MWRD\)](#) to conduct surveillance at two main levels: wastewater treatment plants, and neighborhood sewers.

The three large wastewater treatment plants serving Chicago and Cook County (the O'Brien, Stickney and Calumet Water Reclamation Plants) each collect and process wastewater from over a million people. Samples are also collected from eight local sewers in Chicago, including one in each [Healthy Chicago Equity Zone](#). The number of people living in each sewershed ranges from 3,816 to 83,455 people (**Figure 1**).

Samples are currently collected from each plant and neighborhood sewer 5 times each week. As recommended by the CDC, the concentration of SARS-CoV-2 is compared to the concentration of Pepper Mild Mottle Virus (PMMoV). The PMMoV concentration reflects the amount of human waste in wastewater relative to other things like stormwater runoff.

Figure 1: Wastewater treatment plants (left) and neighborhood sewers (right) that are monitored for SARS-CoV-2.



Wastewater concentrations in the Chicago region

Figure 2: Bottom: SARS-CoV-2 concentration at each water reclamation plant serving Chicago (points) and trend lines. Please note: Stickney WRP is represented by two locations representing the two pipes that carry sewage into the facility. **Top:** 7-day rolling average of daily infections per 100,000 Cook County residents (blue), July-November 2022. The line is a trend of the population-weighted sum of daily viral load from the treatment plants that serve Chicago. Concentration levels were trending upward during November.

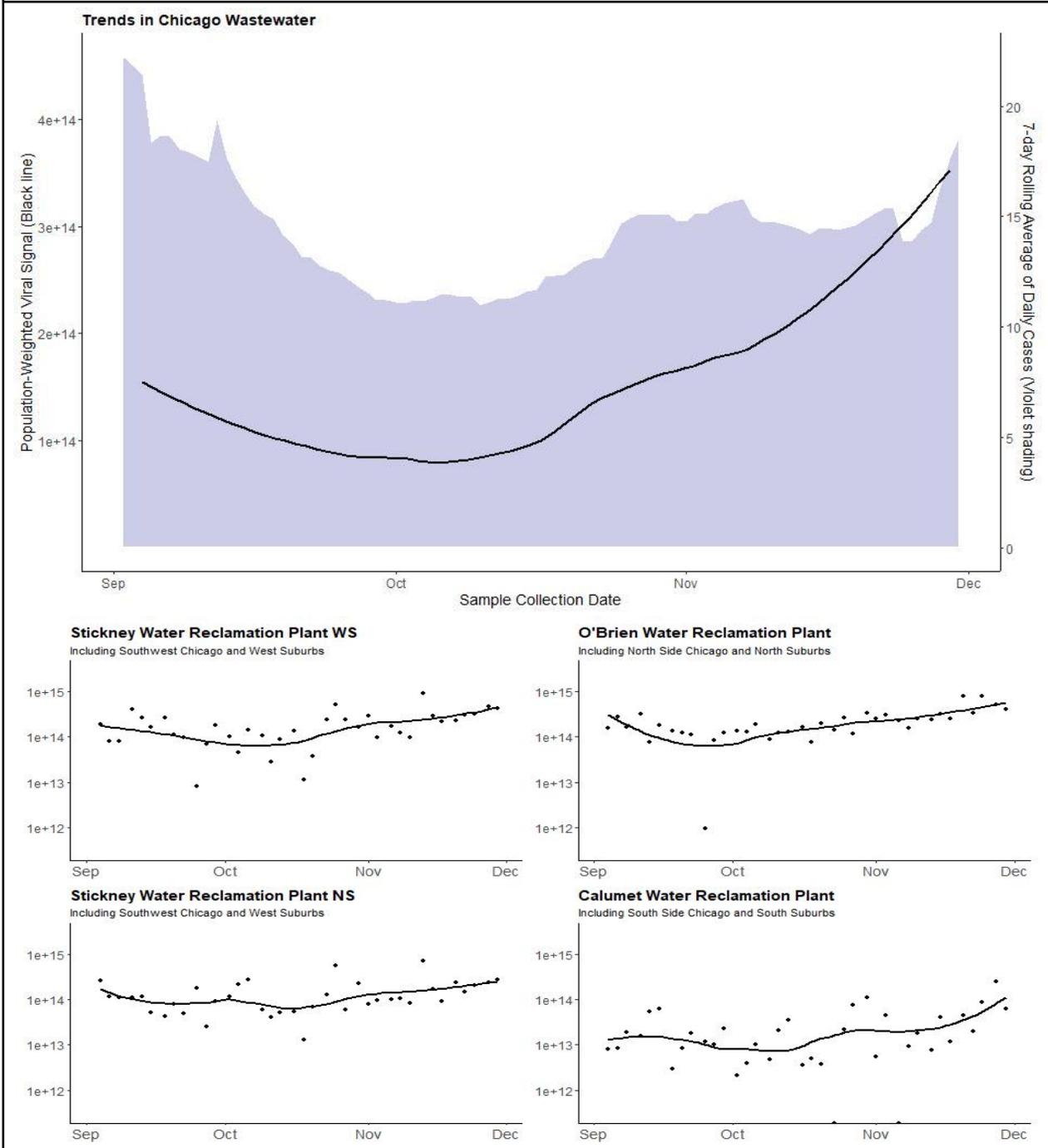
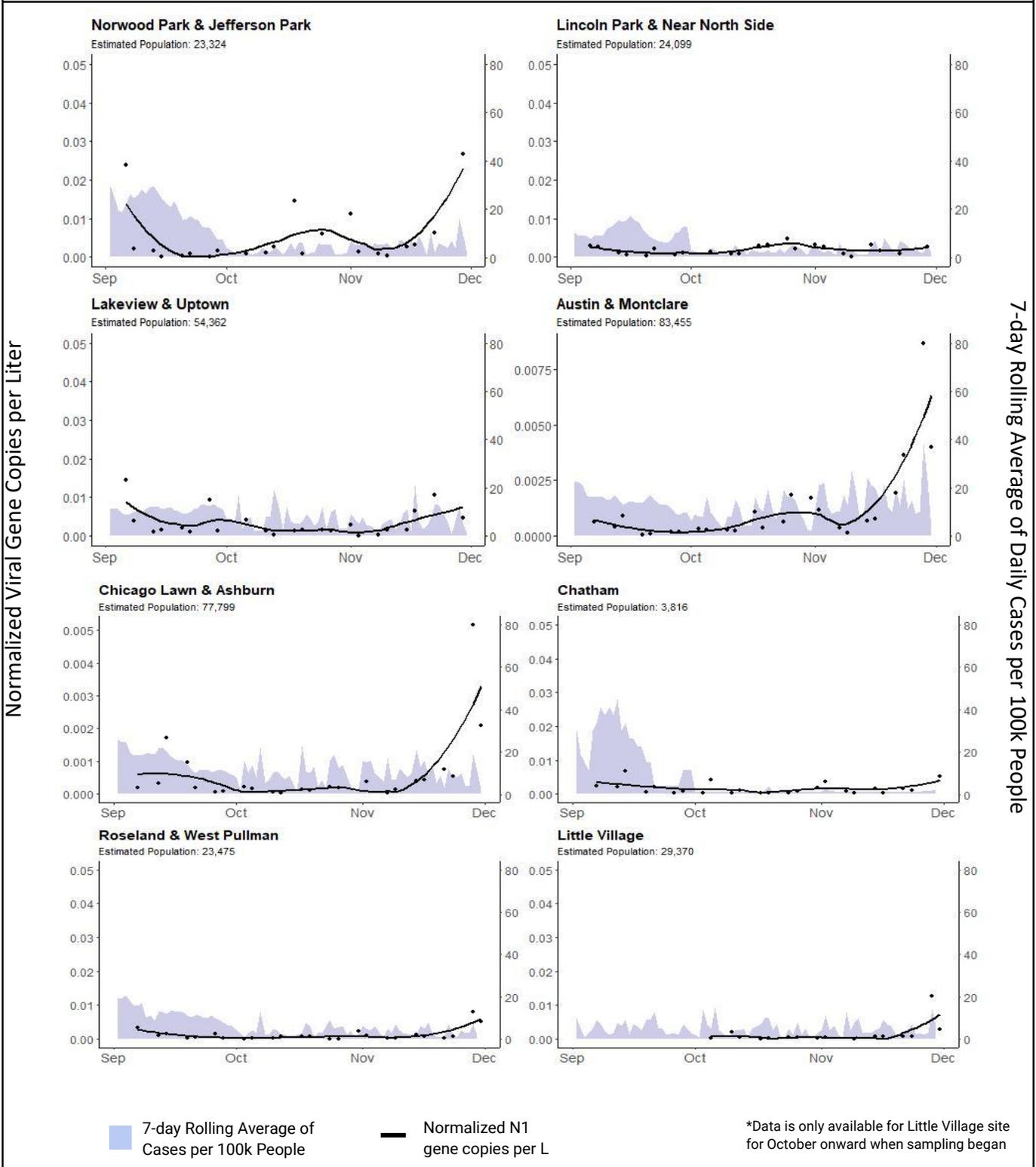


Figure 3. SARS-CoV-2 concentration at 8 sewersheds in Chicago normalized to the concentration of the human waste signal marker PMMoV (lines) and compared to the 7-day rolling average of daily infections in each sewershed per 100,000 people (blue). Catchment population estimates were calculated using 2020 US Census data.



What comes next?

IDPH, CCDPH and CDPH continue to refine wastewater monitoring systems in the Chicago region and across the state. Wastewater data, which is not affected by reporting to public health authorities, may become more valuable for monitoring levels of community transmission.

Regularly updated data is available through the [Wastewater Surveillance dashboard on the CDC's COVID-19 Data Tracker](#).

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